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OCEAN BOTTOM EXPLORATION SYSTEM

A collaborative effort between JPL and the British Institute of Oceanographic Sciences (IOS) has resulted in a unique synoptic image of the Atlantic Ocean floor near the Azores. Using image processing techniques developed for space missions, a mosaic was produced enabling ocean scientists to view significant portions of the ocean bottom at about the same scale that Earth scientists view the Earth using data from Landsat or Seasat.

The striking 90 x 90-kilometer image of the Mid-Atlantic Ridge was generated from analog recordings of long-range side-looking sonar signals made by IOS scientists employing a GLORIA system towed by the RRS Discovery during a 1978 oceanographic voyage. (GLORIA stands for Geologic Long Range Inclined Asdic.)

At JPL signals were digitized and submitted to computer processing, analysis, and enhancement. Images were registered to a map base and montaged to produce the mosaic.

Computer image processing of sonar signals at JPL is performed as part of the Seafloor Remote-Sensing Project, which applies the techniques originally developed for Earth and planetary remote-sensing.

Figure (opposite page): The scarped seafloor of the Mid-Atlantic Ridge, northwest of the Azores, is shown in this JPL mosaic produced from sonar signal recordings made by the British GLORIA system. The deep-tow system viewed the terrain at synoptic scales, 60 kilometers per swath. The image represents an area roughly 90 km on a side. The visible north-south scarps were believed to be formed by creation of new crust on the ridge coupled with a pulling apart of the ridge flanks by seafloor spreading.